Understanding hydroxyl radical processing of trace gases in a variety of environments

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The hydroxyl radical (OH) mediates virtually all of the oxidative chemistry in the atmosphere. Global OH concentrations control the lifetime of the climate gas, methane. Whilst in urban regions OH-initiated reactions dominate the transformation of primary emissions into secondary pollutants such as NO_2, O_3 and secondary organic aerosols.

Combining measurements of OH, peroxy radicals and OH reactivity with near-explicit chemistry models and budget analyses can provide a means to test our understanding of the chemistry occurring in a particular environment.

Taking examples of field observations and model comparisons of radical concentrations in a variety of environments ranging from the pristine open ocean to polluted mega-cities, this talk will demonstrate atmospheric conditions where the chemistry is understood and environments where our understanding of the chemistry is incomplete and highlight that understanding the sources and sinks of OH in the atmosphere is essential in improving predictions of the lifetime of trace gases.